

UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

Application For Preliminary Permit Joe Hardin Lock & Dam Project

FERC PROJECT NO. P-_____

**Applicant: Hydropower Highway, llc.
Agent: Adam Rousselle Sr.**

VERIFICATION

This Application for preliminary permit is executed in the

State of South Carolina

County of Charleston

BY: Adam Rousselle Sr.

2113 Middle Street Suite 201

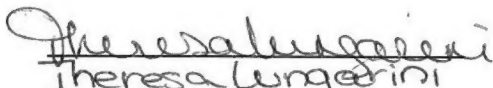
Sullivan's Island, SC 29482

Being duly sworn, deposes and says that the contents of this application are true and to the best of his knowledge or belief. The undersigned applicant has signed the application this 12th day of June 2021



Adam Rousselle Sr.

Subscribed and sworn before me, a notary Public of the State of South Carolina this 12th day of June 2021.


Theresa Lungarini
Notary Public

THERESA LUNGARINI Notary Public State of South Carolina <u>My Commission Expires Jun 25, 2029</u>
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(a) Initial statement

BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

*Application for Preliminary
Permit*

1. Joe Hardin Lock & Dam applies to the Federal Energy Regulatory Commission for a preliminary permit for the proposed Joe Hardin Lock & Dam Hydro Project, as described in the attached exhibits. This application is made in order that the applicant may secure and maintain priority of application for a license for the project under Part I of the Federal Power Act while obtaining the data and performing the acts required to determine the feasibility of the project and to support an application for a license.

2. The location of the proposed project is:

I. State or territory: AR

County: Jefferson

Township or nearby town:
Gillett

Gillett Gillette City Hall 209 W. Main St. Gillette, AR72055
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Federal Facilities Involved: CESAW

Stream or other body of water: Arkansas

- II. Every city, town, or similar local political subdivision:

(A) In which any part of the project, and any Federal facilities that would be used by the project, would be located:

(B) That has a population of 5,000 or more people and is located within 15 miles of the project dam:

None

III. Every irrigation district, drainage district, or similar special purpose political subdivision

- (A) In which any part of the project, and any Federal facilities that would be used by the project, would be located; or

None

- (B) That owns, operates, maintains, or uses any project facilities or any Federal facilities that would be used by the project:

CESAW
P.O. Box 867
Little Rock, AR 72203-0867

IV. Every other political subdivision in the general area of the project that there is reason to believe would likely be interested in, or affected by, the application; and

Bruce Westerman
#4
100 E. 8th St., Room 2521
Pine Bluff, AR 71601

V. All Indian tribes that may be affected by the project.

Bruce Westerman
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100 E. 8th St., Room 2521
Pine Bluff, AR 71601

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Pine Bluff, AR 71601

Bruce Westerman
#4
100 E. 8th St., Room 2521
Pine Bluff, AR 71601

3. Applicant's Contact Information

The exact name, business address, and telephone number of the applicant are:

Hydropower Highway, llc.
2113 Middle Street Suite 202
Sullivans Island SC 29482
arousselle@hydropowerhighway.com
267-254-6107

The exact name and business address of each person authorized to act as agent for the applicant is:

Adam Rousselle Sr.
Hydropower Highway, llc.
2113 Middle Street Suite 202
Sullivans Island SC 29482
arousselle@hydropowerhighway.com
267-254-6107

4. Statement of Authority:

Hydropower Highway, llc.. is a Corporation located in Pennsylvania, it is organized under the laws of the Commonwealth Of Pennsylvania and as such, the Applicant is qualified under §4(e) of the Federal Power Act (FPA) to hold hydroelectric licenses issued under Part 1 of the FPA. The Applicant is not claiming preference under §7(a) of the FPA at this time.

5. The proposed term of the requested permit is 48 Months.

6. Existing Dams or Other Project Facilities

CE

Exhibit 1- Project Description

- 1) **The number, physical composition, dimensions, general configuration and, where applicable, age and condition, of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, that would be part of the project:**

The proposed Joe Hardin Lock & Dam Hydroelectric Project will be located on the Arkansas, in Jefferson County, AR. The Project will be located at and utilize the hydropower potential created by the USACE's Joe Hardin Lock & Dam. The lock and dam was completed in 1968 and is owned and operated by the USACE for the purposes of navigation and recreation on the Arkansas.

The existing dam is type. consists of a 1080-ft-long spillway section. The dam has a maximum structural height of 45 ft, and length of 6720 ft.

A portion of the concrete gravity overflow weir would be modified in order to develop the Project. Studies and discussions with the Army Corps will need to be conducted to determine the appropriate solution.

The existing Joe Hardin Lock & Dam is further described in the following table:

Joe Hardin Lock & Dam

Year Completed	1968
County	Jefferson
River	Arkansas
Overall Length	6720
Structural Height	45

- 2) **The estimated number, surface area, storage capacity, and normal maximum surface elevation (mean sea level) of any reservoirs, whether existing or proposed, that would be part of the project;**

The proposed development of the site involves the construction of a new 161 MW hydropower facility at the existing Lock and Dam. The project will consist of the following major elements:

Powerhouse – The powerhouse will be a cast-in-place reinforced concrete structure. The structure will be monolithic and about 248 feet long by 210 feet wide. The top of the powerhouse intake structure will be at the same elevation as the top of the existing weir and just above the deck of the powerhouse. The powerhouse will be designed to be submerged during flood conditions.

The powerhouse will support columns of runway frames for overhead powerhouse cranes. The crane rails will be at an elevation above the flood of record elevation. The cranes will operate in the direction of flow, and one crane will be located over each unit permitting handling the intake trash-racks, intake and draft tube bulkheads, the emergency closure gate, and equipment to be temporarily placed on the roof deck. Principal equipment to be hoisted in or out of the powerhouse, including the turbines and generators, will be handled from the main hook of the powerhouse cranes via waterproof hatches in the roof.

Access to the powerhouse will be via the Access Road Identified on the map.

Given currently available information, the intake channel length estimate is 45 feet and the tailrace channel length estimate is 57 feet.

Retaining walls will be constructed to retain the backfill that will tie the powerhouse to existing infrastructure. The retaining walls will be designed and configured to conform to the geometry of the intake and tailrace channels and will be founded on rock. The retaining walls will be integrated with the existing infrastructure.

The powerhouse and retaining walls will be stable, safe from overturning, sliding, and within the allowable compressive stress and shear resistances of the foundation for the usual, unusual, and extreme loading cases as defined in the FERC and Army Corps of Engineer's guidelines.

Excavation for the powerhouse structure, intake channel and tailrace channel will extend into the rock foundation. Rock traps will be located immediately upstream of the intake and immediately downstream of the draft tube.

Excavation and backfill will be to stable slopes and anchored as required in the approach and tailrace channel. Final alignments and slopes will be determined after the physical hydraulic model study and stability analyses are completed. Excavation of the approach channel entrance as well as the tailrace channel exit will be by dredging as they are located outside the proposed cofferdam. The remainder of the excavation including all of the rock excavation will be done within the cofferdam area.

The design of the intake approach and tailrace channels will be determined in conjunction with the Army Corps of Engineers so as to minimize the effect of the project on navigation. The intake channel will be configured and designed for hydraulic efficiency. The tailrace channel will be configured and designed to reduce discharge velocities in the channel and to minimize additional erosion protection requirements. If needed, a submerged groin will be located within the lower pool to mitigate effects of the tailrace discharge on entry into or exit from the existing navigation lock. The need for, size, location and orientation of the groin will be determined by the physical hydraulic model as will the final configuration of the intake and tailrace channel. The location of the groin will be identified by surface buoys if constructed.

Temporary upstream and downstream cofferdams will be required during construction of the Project. The cofferdams will be circular steel sheet pile cells filled with granular materials. The cofferdam cells will be connected to a land side earth fill cofferdam on the south abutment.

The cofferdams will extend no further into the river than necessary.

Cofferdam designs will be developed by the contractor's engineer and will be worked out with review by the Army Corps of Engineers and the FERC. After they are no longer needed, the cofferdam cut and fill materials used in the cofferdams will be removed.

- 3) The estimated number, length, voltage, interconnections, and, where applicable, age and condition, of any primary transmission lines whether existing or proposed, that would be part of the project [see 16 U.S.C. 796(11)];**

The project will utilize 1 newly constructed underground transmission line of 129 miles. The transmission line will connect the generator at the Joe Hardin Lock & Dam to 3 Charging Complexes: I-40 W A & B Memphis and I-40 E Memphis Rest Stops. For informational purposes: the Electric Vehicle Charging Complex which will include a hydrogen electrolysis manufacturing facility to provision both Electric Vehicle Charging as well as to serve as a distributed point source of renewable Hydrogen. There are no interconnections to the electric grid. The transmission right of way boundary is included within the attached maps.

- 4) The total estimated average annual energy production and installed capacity (provide only one energy and capacity value), the hydraulic head for estimating capacity and energy output, and the estimated number, rated capacity, and, where applicable, the age and condition, of any turbines and generators, whether existing or proposed, that would be part of the project works;**

The proposed Project will include an intake approach channel, a reinforced concrete powerhouse, and a tailrace channel. The powerhouse will house a horizontal bulb-type turbine generating an estimated total rated capacity of 161 megawatts at gross operating head of 20 feet.

The generator(s) rated at 161 MVA are assumed to have a 0.9 power factor, accordingly, the annual gross energy generation will average about 1410360 MWh per year.

- 5) All lands of the United States that are enclosed within the proposed project boundary described under paragraph (d)(3)(i) of this section, identified and tabulated on a separate sheet by legal subdivisions of a public land survey of the affected area, if available. If the project boundary includes lands of the United States, such lands must be identified on a completed land description form (FERC Form 587), provided by the Commission. The project location must identify any Federal reservation, Federal tracts, and townships of the public land surveys (or official protractations thereof if unsurveyed). A copy of the form must also be sent to the Bureau of Land Management state office where the project is located;**

There are no known areas within or in the vicinity of the proposed project boundary that are included in or have been designated for study for inclusion in the National Wild and Scenic Rivers System.

There are no areas within the proposed project boundary that are known to be under the provisions of the Wilderness Act.

6) Any other information demonstrating in what manner the proposed project would develop, conserve, and utilize in the public interest the water resources of the region

The Hydropower Highway provides 100% renewable energy with ubiquitous access to charging stations along federal highways and critical city center parking lots. We deploy a firm fixed pricing strategy with an improved power quality which will survive natural disasters and thus dependable for major commerce to rely upon.

The Hydropower Highway does not connect to the utility's grid and thus its electricity prices are lower.

The Hydropower Highway is underground and hardened against climate change and all hazards and thus has lower maintenance costs and higher reliability.

The Hydropower Highway relies upon America's non-powered dams, locks and dams and quarries as a distributed power source which are proximate to major travel corridors, thus reducing investment in transmission systems.

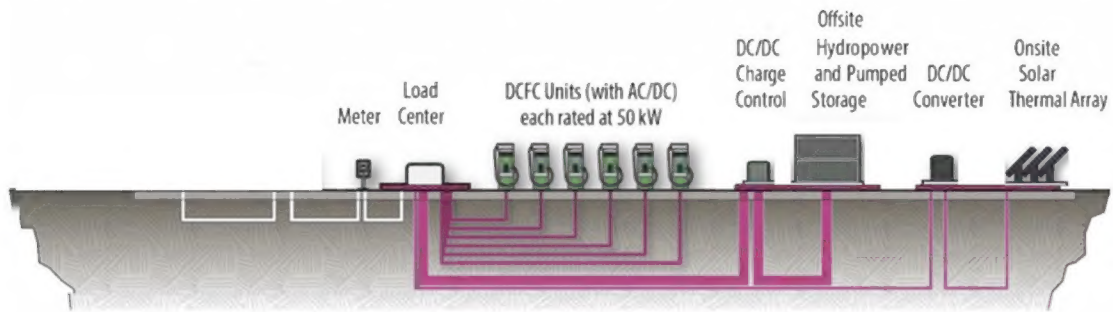
The Hydropower Highway reduces the voltage spikes that a traditional distribution system would experience while providing a smaller environmental footprint.

The proposed Joe Hardin Lock & Dam Hydro Project will be achieved by installing a new closed loop hydroelectric generators which will utilize modern, Voith Hydro state-of-the- technology to optimize the clean, renewable electricity generating potential of this site in a manner that best develops, conserves and utilizes this hydropower resource.

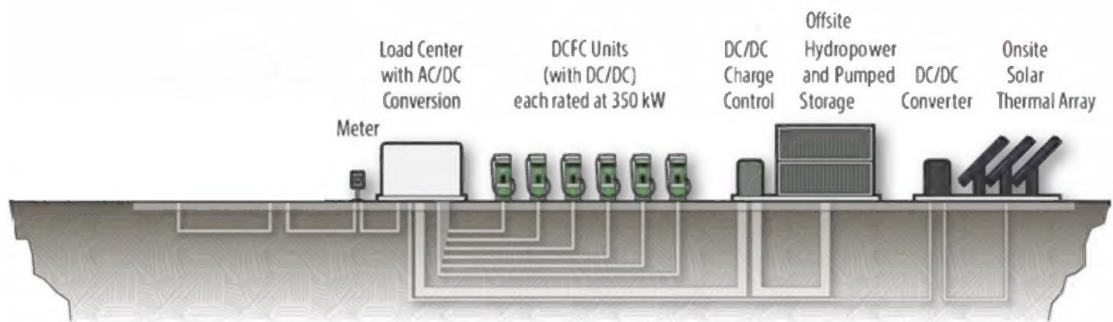
The proposed project will fulfill the public interest for a less expensive, more reliable and environmentally sound source of renewable energy.

The use of this existing water resource will also serve to utilize the region's potentially generous supply of renewable resources (RR), provision renewable energy for electric vehicle charging while enhancing local economics through creation of jobs during construction and for operations.

The Hydropower Highway Electric Vehicle Complex* would include the following:



A) DCFC complex with 50-kW chargers with distributed renewable systems at initial installation



B) DCFC complex with 350-kW chargers and the same distributed renewable systems

The Hydropower Highway strategy for upgrade from 50-kW complex with distributed Hydropower and Solar Thermal to 350-kW complex. Magenta highlights in Figure a show how surface and underground work should be over-built initially to preclude the need for rework upon future upgrade. Figure b shows the complex upgraded to the future design.

*Figure 1 *For Informational Purposes Only*

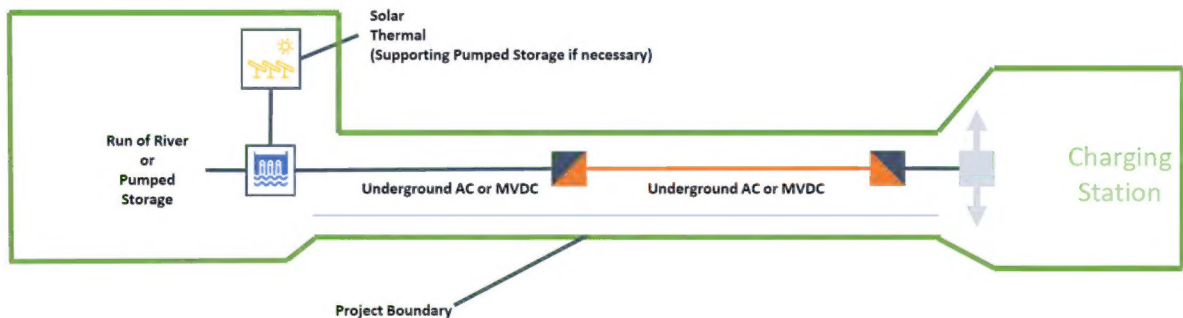


Figure 2 Example One Line Drawing

HYDROPOWER TECHNOLOGY



Figure 3 Stream Diver Technology



Figure 4 Stream Diver Installation

Exhibit 2- Description Of Studies

1) *General requirement.* For any proposed project, a study plan containing a description of:

- i. Any studies, investigations, tests, or surveys that are proposed to be carried out, and any that have already taken place, for the purposes of determining the technical, economic, and financial feasibility of the proposed project, taking into consideration its environmental impacts, and of preparing an application for a license for the project:

The Applicant has reviewed substantial topographical, parcel ownership, municipal, economic as well as the mechanical and environmental aspects of the project and conducted a field visit.

The studies and related work to be completed will provide the applicant with the necessary information to prepare the application for license and to progress the concept development plan to final design. All work will be conducted in a manner so as not to affect cultural resources or endangered species, if any, and to cause minimal disturbance to the land and water. Any land altered or disturbed will be adequately restored to the satisfaction of the owner. The applicant proposes to carry out the studies below to determine the feasibility of the proposed project and support an application for license.

As the studies are being conducted the applicant will consult with appropriate federal, state, municipal and local agencies. The exact scope and scheduling of studies will be coordinated in accordance with consultation related to the integrated licensing process.

- ii. The approximate locations and nature of any new roads that would be built for the purpose of conducting the studies.

There are no new roads envisioned to be built for this project.

2) *Work plan for new dam construction.* For any development within the project that would entail new dam construction, a work plan and schedule containing:

There are no new dams envisioned for this project.

3) Description Of Studies

Geotechnical Studies

The applicant will have a geotechnical engineer review existing geotechnical information and perform a current review and analysis of the project site. The geotechnical engineer will also analyze the geotechnical suitability of the foundation material for construction of any potential location for powerhouse and other structures.

4.1 Water Quality Studies

Data collection for water quality will consist of reviewing existing water quality and effects of the lower reservoir based on field sampling.

4.2 Recreation Studies

Analysis will be performed to assess potential use of the project area for to ensure that do not interfere with current recreational activities.

4.3 Historic And Archaeological Studies

There are no records of archaeological studies. Should any such studies exist, the applicant will have a qualified cultural resources firm review any previous studies and other existing documents, as required, to determine if any additional studies are warranted at this time.

4.4 Fisheries Studies

A fisheries study will be conducted.

4.5 Preliminary Design Studies

Preliminary engineering design of the proposed powerhouse and electrical faults will be prepared to delineate the scope, cost and schedule for construction. A projection of energy generation will also be made. The preliminary design data will be utilized in the economic analysis to be performed for the proposed project.

4.6 Economic Analyses

Economic analyses of the proposed project will be performed. The analysis will include estimates of power production and power sales rates. A transmission interconnection study will be performed to determine best location for interconnection and feasibility. The Economic criteria such as net revenue, net present value and benefit/cost ratio will be determined.

4.7 Roads

No new roads will be built for the purpose of conducting the studies referenced herein.

4.8 New Dam Construction

The proposed project is located at an existing dam and a new dam will not need to be constructed.

4.9 Schedule For Studies

The following schedule has been developed for conducting the studies and consultations specified herein and leading up to the submission of a license application to the Commission at the conclusion of the requested 48-month term of the permit. This schedule assumes that a permit will be issued to the Applicant by July, 2021. Based on the work to be performed under the requested permit, the Applicant will make a determination as to whether it is appropriate to follow the Integrated Licensing Process or request a waiver for either the Alternative or Traditional Licensing Process.

Permit Issued	July 2021
Perform Studies	April 2021- December 2022
Complete Initial Environmental Analysis	August 2021
Initiate License Process	February 2023
File License Application at FERC	July 2023

4.10 Estimated Costs

The estimated costs of carrying out and preparing the studies, investigations, tests, surveys, maps, plans and specifications identified in Exhibit 2 is \$1,355,000.00 allocated as follows.

General Plan and Geotechnical Studies	\$150,000.00
Water Quality Studies	\$150,000.00
Recreational Studies	\$125,000.00
Historic and Archaeological Studies	\$150,000.00
Fisheries Studies	\$250,000.00
Preliminary Design Studies	\$375,000.00
Economic and Market Analysis	\$355,000.00
Total	\$1,555,000.00

4.11 Financial Sources

The applicant will provide the necessary financing to conduct the activities identified in Exhibit 2.

4.12 Proposed Market

Through the development of the proposed Joe Hardin Lock & Dam Hydro Project, the applicant will provide an additional source of clean, renewable energy that will provide added stability and capacity to the local customers. It is proposed that the electricity generated at the Joe Hardin Lock & Dam will be offered at market rates to critical Infrastructure behind the meter. Project revenues are expected to be adequate to construct and operate the Hydro Project and to yield a reasonable rate of return on investment.

This project will create economic growth in several industries:

As of the application date of this preliminary permit there were no known 350 kW charging stations along the US Interstate highways. Accordingly, the manufacture of heavy duty, long range commercial electric vehicle manufacturing is stymied due to the lack of electric fueling stations.

As of the application date of this preliminary permit there were 6 known hydrogen charging stations along the US Interstate highways. Accordingly, the manufacture of heavy duty, long range commercial electric vehicle manufacturing is stymied due to the lack of hydrogen fueling stations.

This hydropower generator will connect to Truck rest Stops along interstate highways and accelerate the manufacturing of electric and vehicles, electric vehicle charging stations and Hydrogen refueling stations.

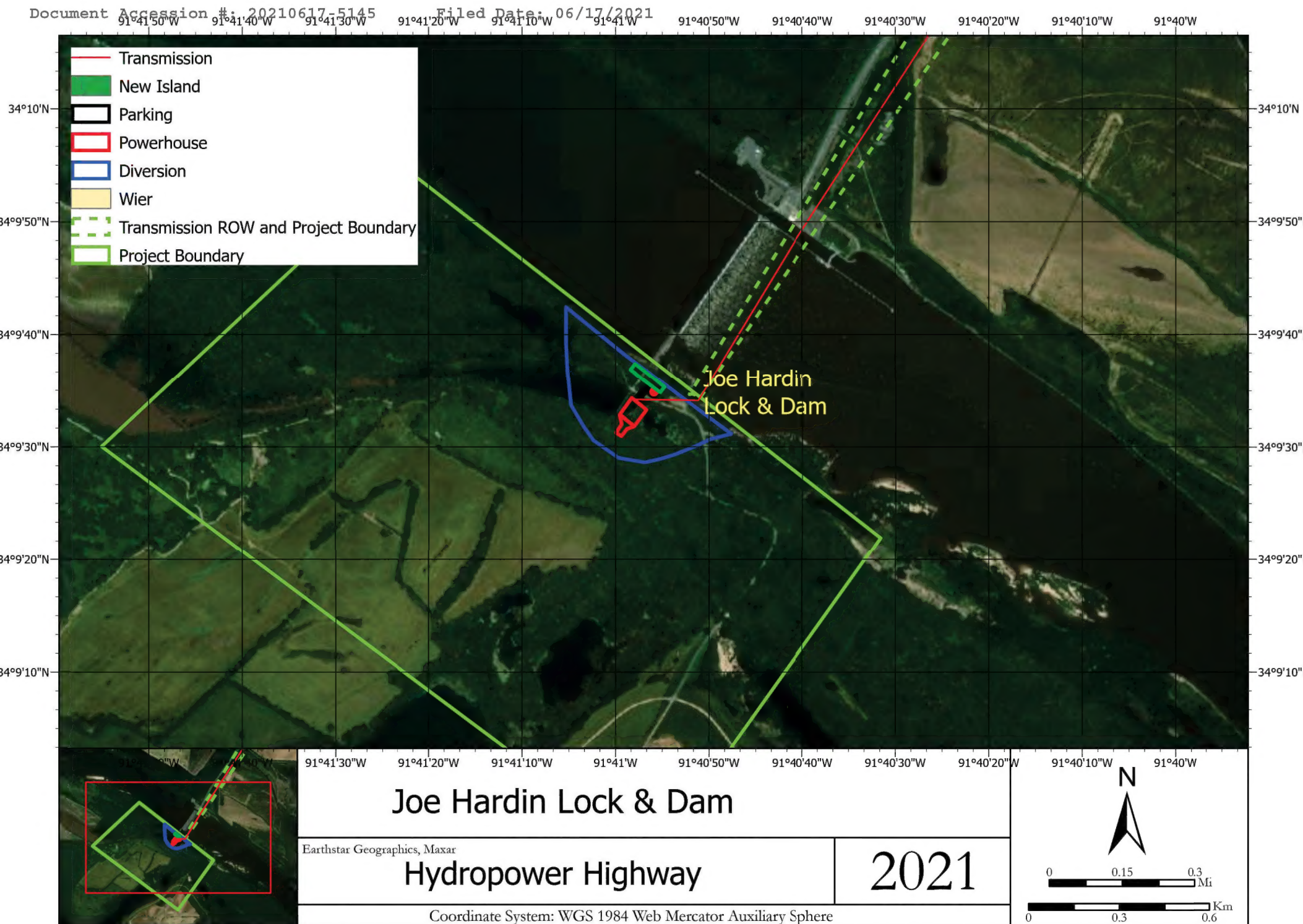


EXHIBIT 3 FIGURE 1 PROJECT DETAIL MAP

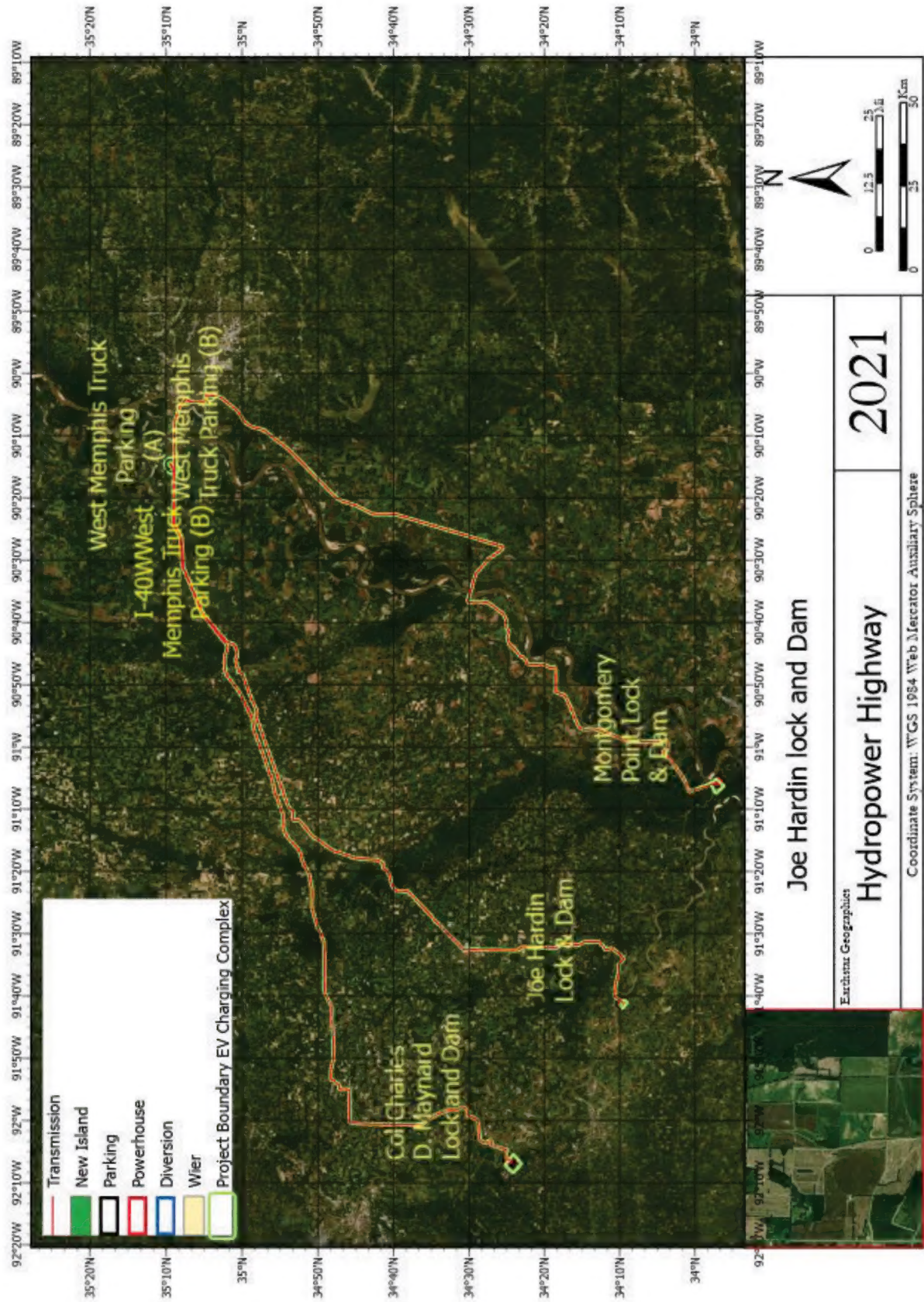


EXHIBIT 3 FIGURE 2 PROJECT GENERAL MAP

rm FERC-587 OMB No. 1902-0145

(Expires 10/31/2021)

Exhibit 3: Land Description

Non-Public Land States
(and Non-Rectangular Survey System Lands in Public Land States)

1. STATE 2. FERC PROJECT NO.

3. FEDERAL RESERVATION:

4. FEDERAL LAND HOLDING AGENCY:

5. Counties:

6. Check one:

☐ License

☒ Preliminary Permit

Check one:

☒ Pending

☒ Issued

If preliminary permit is issued, give expiration date: N/A

7. Federal Tract(s) Identification
See Exhibit 3 Figure 1

8. Exhibit Sheet Number(s) or Letter(s)

9. Contact's name:

Telephone no. (267) 254-6107

Date submitted 1/18/2021

This information is necessary for the Federal Energy Regulatory Commission to discharge its responsibilities under Section 24 of the Federal Power Act.

Document Content(s)

Joe Hardin Project General Map Filed.PDF.....1